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1 Poster session: Constrained modifications of non-manifold B-reps

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Guillaume Caumon, Charles H. Sword, Jean-Laurent Mallet
June 2003 Proceedings of the eighth ACM symposium on Solid modeling and
applications

Full text available: pdf(2.88 MB)

Additional Information: $\underline{\text{full citation}}$, $\underline{\text{abstract}}$, $\underline{\text{references}}$, $\underline{\text{index}}$ terms

Non-manifold boundary representations (b-reps) are increasingly used in Geosciences for a variety of applications (3D geographical information systems, basin modeling, geophysical processing, etc.). Meanwhile, the uncertainties associated with subsurface data make it desirable to modify such models efficiently. We present a method to deform locally a surface in a triangulated b-rep while maintaining a constant number of spatial regions in the model. This method does not require completely rebuild ...

2 Simulating facial surgery using finite element models



Rolf M. Koch, Markus H. Gross, Friedrich R. Carls, Daniel F. von Büren, George Fankhauser, Yoav I. H. Parish

August 1996 Proceedings of the 23rd annual conference on Computer graphics and interactive techniques

Full text available: pdf(549.30 KB)

Additional Information: full citation, references, citings, index terms

Keywords: data reconstruction, facial modeling, facial surgery simulation, finite element method

3 The Matrix revealed: Universal capture: image-based facial animation for "The Matrix Reloaded"



George Borshukov, Dan Piponi, Oystein Larsen, J. P. Lewis, Christina Tempelaar-Lietz

July 2003 Proceedings of the SIGGRAPH 2003 conference on Sketches & applications: in conjunction with the 30th annual conference on Computer graphics and interactive techniques

Full text available: pdf(484.58 KB)

Additional Information: full citation

4 Linear light source reflectometry

Andrew Gardner, Chris Tchou, Tim Hawkins, Paul Debevec
July 2003 ACM Transactions on Graphics (TOG), Volume 22 Issue 3

Full text available: pdf(12.74

Additional Information: full citation, abstract, references

This paper presents a technique for estimating the spatially-varying reflectance properties of a surface based on its appearance during a single pass of a linear light source. By using a linear light rather than a point light source as the illuminant, we are able to reliably observe and estimate the diffuse color, specular color, and specular roughness of each point of the surface. The reflectometry apparatus we use is simple and inexpensive to build, requiring a single direction of motion for t ...

5 3D texture: Shell texture functions

Yanyun Chen, Xin Tong, Jiaping Wang, Stephen Lin, Baining Guo, Heung-Yeung Shum August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3

Full text available: pdf(1.40 MB) Additional Information: full citation, abstract, references

We propose a texture function for realistic modeling and efficient rendering of materials that exhibit surface mesostructures, translucency and volumetric texture variations. The appearance of such complex materials for dynamic lighting and viewing directions is expensive to calculate and requires an impractical amount of storage to precompute. To handle this problem, our method models an object as a shell layer, formed by texture synthesis of a volumetric material sample, and a homogeneous inne ...

Keywords: BTF, Texture mapping, mesostructure, reflectance and shading models, subsurface scattering, texture synthesis

6 <u>Session P3: volume visualization I: Interactive translucent volume rendering</u> and procedural modeling

Joe Kniss, Simon Premoze, Charles Hansen, David Ebert
October 2002 Proceedings of the conference on Visualization '02

Full text available: pdf(37.78 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, index terms

Direct volume rendering is a commonly used technique in visualization applications. Many of these applications require sophisticated shading models to capture subtle lighting effects and characteristics of volumetric data and materials. Many common objects and natural phenomena exhibit visual quality that cannot be captured using simple lighting models or cannot be solved at interactive rates using more sophisticated methods. We present a simple yet effective interactive shading model which capt ...





Keywords: procedural modeling, shading model, volume modeling, volume rendering

7 Realistic modeling for facial animation

Yuencheng Lee, Demetri Terzopoulos, Keith Walters

September 1995 Proceedings of the 22nd annual conference on Computer graphics and interactive techniques

Full text available: pdf(681.19

KB) ps(4.37 Additional Information: <u>full citation</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

Keywords: RGB/Range scanners, discrete deformable models, facial animation, feature-based facial adaptation, physics-based facial modeling, texture mapping

8 Synthesizing realistic facial expressions from photographs

Frédéric Pighin, Jamie Hecker, Dani Lischinski, Richard Szeliski, David H. Salesin July 1998 Proceedings of the 25th annual conference on Computer graphics and interactive techniques

Full text available: pdf(276.04 KB)

Additional Information: full citation, references, citings, index terms

Keywords: facial animation, facial expression generation, facial modeling, morphing, photogrammetry, view-dependent texture-mapping

9 User interfaces: Management and visualization of large, complex and time-dependent 3D objects in distributed GIS

S. Shumilov, A. Thomsen, A. B. Cremers, B. Koos

November 2002 **Proceedings of the 10th ACM international symposium on Advances in geographic information systems**

Full text available: pdf(856.25 KB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>index</u> terms

This paper presents solutions for architectures of distributed GIS employed for large scale geological modeling in contrast with more traditional GIS. Key technologies are proposed for dealing with complex geological spatio-temporal 3D models. These techniques are then illustrated on a prototype system developed to support interactive work on large models employed by existing geological 3D modeling tools. This prototype has already been successfully applied to the construction of large 3D and 4D ...

Keywords: 3D/4D geological modeling, CORBA, Java, VRML, VTK, animation, data selection and retrieval, distributed spatial databases, mesh decimation, open GIS, progressive transmission, temporal spatial data, visualization

10 Mesh parameterization: Pa		
•	ons on Graphics (TOG), Volume 23 Issue 3	
Full text available: pdf(25.68 MB)	Additional Information: full citation, abstract, references	
surface, usually with a texture image. Many good evenly distribute texture survature, and some are e	nique that allows a user to paint a texture directly onto a cture atlas: a 1:1 mapping between the surface and its d automatic texture atlas generation methods exist that samples across a surface based on its area and/or even sensitive to the frequency spectrum of the input the surface painting process, the texture can change.	
Keywords : 3D painting,	Mesh parametrization, face clustering, texture atlas	
11 Skinning: EigenSkin: real (time large deformation character skinning in hardware	_
Paul G. Kry, Doug L. James,	Dinesh K. Pai	
July 2002 Proceedings of t on Computer ani	he 2002 ACM SIGGRAPH/Eurographics symposium	
Full text available: 🔁 pdf(5.22 MB	A deliking of Information, full pitation, abstract, references, pitimes	
articulated characters to be which are optimized for re method extends the common provide efficient approxime	which allows subtle nonlinear quasi-static deformations of the compactly approximated by data-dependent eigenbases real time rendering on commodity graphics hardware. The mon Skeletal-Subspace Deformation (SSD) technique to nations of the complex deformation behaviours exhibited in diartist-drawn characters. Instead of storing displacements	
	desire were defermention unincinal commonant	
analysis, skeletal-subspac	dering, pose-space deformation, principal component ce deformation	

12 Deformable objects: Point based animation of elastic, plastic and melting

August 2004 Proceedings of the 2004 ACM SIGGRAPH/Eurographics

Full text available: pdf(305.14 Additional Information: full citation, abstract, references, index

terms

M. Müller, R. Keiser, A. Nealen, M. Pauly, M. Gross, M. Alexa

KB)

symposium on Computer animation

3/17/05 3:34 PM

objects

We present a method for modeling and animating a wide spectrum of volumetric objects, with material properties anywhere in the range from stiff elastic to highly plastic. Both the volume and the surface representation are point based, which allows arbitrarily large deviations form the original shape. In contrast to previous point based elasticity in computer graphics, our physical model is derived from continuum mechanics, which allows the specification of common material properties such as Y ...

13 Articulated body deformation from range scan data

Brett Allen, Brian Curless, Zoran Popović

July 2002 ACM Transactions on Graphics (TOG), Proceedings of the 29th annual conference on Computer graphics and interactive techniques, Volume 21 Issue 3

Full text available: pdf(2.84 MB) Additional Information: full citation, abstract, references, citings, index terms

This paper presents an example-based method for calculating skeleton-driven body deformations. Our example data consists of range scans of a human body in a variety of poses. Using markers captured during range scanning, we construct a kinematic skeleton and identify the pose of each scan. We then construct a mutually consistent parameterization of all the scans using a posable subdivision surface template. The detail deformations are represented as displacements from this surface, and holes are ...

Keywords: animation, character animation, deformation, human body simulation, synthetic actor

14 Displacement mapping using flow fields

Hans Køhling Pedersen

July 1994 Proceedings of the 21st annual conference on Computer graphics and interactive techniques

Full text available: pdf(240.29

Additional Information: full citation, abstract, references, citings, index terms

Existing displacement mapping techniques operate only in directions normal to the surface, a restriction which limits the richness of the set of representable objects. This work removes that restriction by allowing displacements to be defined along curved trajectories of flow fields. The main contribution of this generalized technique, which will be referred to as flow mapping, is an alternative model of offset surfaces that extends the class of shapes that can be modelled ...

15 Dynamics & modeling: BD-tree: output-sensitive collision detection for reduced deformable models

Doug L. James, Dinesh K. Pai

August 2004 ACM Transactions on Graphics (TOG), Volume 23 Issue 3

Full text available: pdf(425.47 KB)

Additional Information: full citation, abstract, references, index

terms

We introduce the Bounded Deformation Tree, or BD-Tree, which can perform collision detection with reduced deformable models at costs comparable to collision detection with rigid objects. Reduced deformable models represent complex deformations as linear superpositions of arbitrary displacement fields, and are used in a variety of applications of interactive computer graphics. The BD-Tree is a bounding sphere hierarchy for output-sensitive collision detection with such models. Its bounding sphere ...

Keywords: collision, deformable, output-sensitive, sphere trees

16	16 Precomputing interactive dynamic defo	rmable scenes	
	Doug L. James, Kayvon Fatahalian		
	July 2003 ACM Transactions on Graphic	s (TOG), Volume 22 Issue 3	
	Full text available: pdf(10.39 Additional Info	rmation: full citation, abstract, references, index	
	MB)	<u>terms</u>	
	tabulation of the system's deterministic	e method permits real-time hardware mics, including self-contact and global me user interaction. We use data-driven state space dynamics, and model reduction tions of the deformed shapes. To support	
	animation, physically based modeling	onena animation, physically based	
	g		
17	17 Image metamorphosis using snakes an	d free-form deformations	
	Seung-Yong Lee, Kyung-Yong Chwa, Sung September 1995 Proceedings of the 22nd graphics and interactive Full text available: pdf(677.68	Yong Shin d annual conference on Computer	
		rmation: full citation, references, citings, index terms	
	Keywords : image metamorphosis, mor multilevel free-form deformation, snake		
18	18 Poster Session: Deformation of finite el	ement meshes using directly	
	manipulated free-form deformation		
	Norbert Frisch, Thomas Ertl		
	June 2002 Proceedings of the seventh ACM symposium on Solid modeling and		
	applications		
	Full text available: pdf(704.19 Additional Info	rmation: full citation, abstract, references, citings,	
	KB)	index terms	

CrashViewer [5, 18] is a tool for visualizing car crash simulation input and output data consisting of nite element meshes. For a shorter work ow, a feature for local deformation of the car components represented by FE meshes is desired. This feature allows to quickly make minor corrections and enhancements directly on the FE mesh. The roundtrip through the CAD department and the remeshing of the CAD representation is avoided. The crash simulation can be started immediately with the modified car ...

Keywords: CAD, free-form deformation, nite elements

19 Simple constrained deformation	mple constrained deformations for geometric modeling and interactive design $lacksquare$		
Paul Borrel, Ari Rappoport			
April 1994 ACM Transactions	on Graphics (TOG), Volume 13 Issue 2		
Full text available: pdf(9.28 MB)	Additional Information: <u>full citation</u> , <u>abstract</u> , <u>references</u> , <u>citings</u> , index terms, review		

Deformations are a powerful tool for shape modeling and design. We present a new model for producing controlled spatial deformations, which we term Simple Constrained Deformations (Scodef). The user defines a set of constraint points, giving a desired displacement and radius of influence for each. Each constraint point determines a local B-spline basis function centered at the constraint point, falling to zero for points beyond the radius. The deformed image of any point in ...

Keywords: B-splines, constraints, deformation, geometric design, geometric modeling, interpolation, spatial deformation

20 <u>Deformable objects: Quasi-rigid objects in contact</u> Mark Pauly, Dinesh K. Pai, Leonidas J. Guibas

August 2004 Proceedings of the 2004 ACM SIGGRAPH/Eurographics symposium on Computer animation

Full text available: pdf(491.41 Additional Information: full citation, abstract, references, index terms

We investigate techniques for modeling contact between quasi-rigid objects - solids that undergo modest deformation in the vicinity of a contact, while the overall object still preserves its basic shape. The quasi-rigid model combines the benefits of rigid body models for dynamic simulation and the benefits of deformable models for resolving contacts and producing visible deformations. We argue that point cloud surface representations are advantageous for modeling rapidly varying, wide area c

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